



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,323	03/02/2004	Edward Aloysius Fitzgerald	309.030	1825

7590 12/28/2005

Eaton Corporation
Patent Law Department
Eaton Center
1111 Superior Avenue
Cleveland, OH 44114-2584

EXAMINER

ROMAN, LUIS ENRIQUE

ART UNIT	PAPER NUMBER
----------	--------------

2836

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/791,323

Applicant(s)

FITZGERALD ET AL.

Examiner

Luis Roman

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08/23/04, 03/17/05, 03/02/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21 & 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Hongel (US 4959746).

Regarding claim 1 Hongel discloses a device for preventing arcing between contacts (Fig. 4 element 10B) of a switching device as the contacts of the switching device are opened, the switching device including a coil (Fig. 4 element 10A) for controlling the opening of the contacts, the device comprising: a coil suppression circuit (Fig. 4 elements 242, 244) connected in parallel with the coil, the coil suppression circuit dissipating the energy stored in the coil in response to the de-energizing of the coil (col. 12 lines 38-41); and a first solid state switch (Fig. 4 element 26left<G>) having a gate operatively connected (Fig. 4 path determined by elements 26left<G>, 370, 38, 302, 354, 356, 290, 252, 266, 270, 230, 244, 242) to the coil suppression circuit (Fig. 4 elements 242, 244) and being connected in parallel with the contacts (Fig. 4 element 10B), the first solid state switch movable between an open position preventing the flow of current there through and a closed position in response to the dissipation of energy by the coil suppression circuit (col. 4 lines 63-68 & col. 5 lines 1-3).

Regarding claim 2 Hongel discloses the device of claim 1.

Hongel further discloses wherein the coil suppression circuit includes a first zener diode (Fig. 4 element 242) operatively connected to the coil, the first zener diode providing a reference voltage in response to the de-energizing of the coil (col. 12 lines 38-43).

Regarding claim 3 Hongel discloses the device of claim 2.

Hongel further discloses comprising a driver (Fig. 4 element 252) having an input (Fig. 4 primary 254 of element 252) operatively connected to the first zener diode (Fig. 4 element 242) and an output (Fig. 4 secondary 256 of element 252) operatively connected to the gate (Fig. 4 element 26left<G>) of the first solid-state switch, the driver closing the first solid-state switch in response to the reference voltage across the first zener diode (col. 4 lines 16-24).

Regarding claim 4 Hongel discloses the device of claim 3.

Hongel further discloses wherein the driver (Fig. 5 element 252) includes a timing device (col. 2 lines 16-21 & Fig. 4 elements 320, 322) for closing the first solid-state switch (Fig. 4 element 26left) for a predetermined time period.

Art Unit: 2836

Regarding claim 5 Hongel discloses the device of claim 1.

Hongel further discloses wherein the coil suppression circuit includes a second diode (Fig. 4 element 244) operatively connected to the coil (Fig. 4 element 10A) in series with the first zener diode (Fig. 4 element 242).

Regarding claim 6 Hongel discloses the device of claim 5.

Hongel further discloses wherein the first zener diode (Fig. 4 element 242) and the second diode (Fig. 4 element 244) are connected in series and wherein the first zener diode is biased in a first direction and the second diode is biased in a second opposite direction.

Regarding claim 7 Hongel discloses the device of claim 1.

Hongel further discloses comprising a transformer (col. 8 lines 61-65 & Fig. 4 element 252), the transformer having a primary side (Fig. 4 element 254) operatively connected to the coil suppression circuit (Fig. 4 elements 242, 244) and a secondary side (Fig. 4 element 256) interconnected to the gate (Fig. 4 element 26left<G>) of the first solid state switch (Fig. 4 element 26left), the transformer transferring electrical energy from the coil suppression circuit to the gate of the first solid state switch.

Regarding claim 8 Hongel discloses the device of claim 7.

Hongel further discloses comprising a zener diode (Fig. 4 element 310) connected in parallel with the secondary side (Fig. 4 element 256) of the transformer.

Regarding to claim 10 Hongel discloses the device of claim 1.

Hongel further discloses comprising a second solid-state switch (Fig. 4 element 300, where 300 is a multivibrator that changes states) connected in series with the first solid-state switch.

Regarding claim 11 Hongel discloses the device of claim 10.

Hongel further discloses comprising: a first diode (Fig. 5 element 368) connected in parallel with the first solid-state switch (Fig. 5 element 26) the first diode biased in a first direction; and a second diode (Fig. 5 element 374) connected in parallel with the second solid state switch (Fig. 5 element 300, where 300 is a multivibrator that changes states), the second diode biased in a second direction.

Regarding claim 12 Hongel discloses a bypass circuit for preventing arcing of electrical energy passing between first and second contacts (Fig. 4 elements 10B) of a switching device having a coil (Fig. 4 element 10A) wherein the contacts open and close in response to the energization of the coil, the bypass circuit comprising: a first switch connected in parallel with the contacts of the switching device, the first switch (Fig. 4 element 26left) movable between a closed position with the contacts open and an open position with the contacts closed; and an actuation circuit (Fig. 4 determined by elements 254, 256, 290, 356, 354, 302, 38, 370) interconnecting the coil (Fig. 4 element

Art Unit: 2836

10A) and the first switch (Fig. 4 element 26left), the actuation circuit closing the switch in response to the de-energization of the coil.

Regarding claim 13 Hongel discloses the bypass circuit of claim 12.

Hongel further discloses wherein the actuation circuit includes: an energy dissipation device (Fig. 4 element 242) operatively connected to the coil (Fig. 4 element 10A) to dissipate a portion of the energy released by the coil as the coil is de-energized; and a driver (Fig. 5 element 252) interconnecting the energy dissipation device and the first switch, the driver closing the first switch in response to the portion of energy dissipated by the energy dissipation device (col. 4 lines 16-24).

Regarding claim 14 Hongel discloses the bypass circuit of claim 13.

Hongel further discloses wherein the energy dissipation device is a zener diode (Fig. 4 element 242).

Regarding claim 15 Hongel discloses the bypass circuit of claim 13.

Hongel further discloses wherein the driver is a transformer (Fig. 4 element 252), the transformer having a primary side operatively connected to the energy dissipation device (Fig. 4 element 242) and a secondary side operatively connected to the first switch (Fig. 4 element 26left).

Regarding claim 16 Hongel discloses the bypass circuit of claim 12.

The bypass circuit of claim 12 wherein the electrical energy passing between the contacts has an AC waveform (col. 1 lines 56-67; Hongel describe <US 3639808> which discloses a similar circuit for AC) and wherein the bypass circuit further comprises a second switch (Fig. 4 element 26right) operatively connected to the actuation (Fig. 4 element 252) circuit and being connected in parallel with the contacts (Fig. 4 element 10B) of the switching device, the second switch movable between a closed position with the contacts open and an open position with the contacts closed (Fig. 4 element 300, where 300 is a multivibrator that changes states).

Regarding claim 17 Hongel discloses the bypass circuit of claim 12.

Hongel further disclose the bypass circuit of claim 12 further comprising a second switch (Fig. 4 element 300, where 300 is a multivibrator that changes states) operating connected to the first switch (Fig. 4 element 26), the second switch controlling the rate of closure of the first switch.

Regarding claim 18 Hongel discloses a bypass circuit for preventing arcing of electrical energy passing between first and second contacts of a switching device having a coil (Fig. 4 element 10A) wherein the contacts (Fig. 4 element 10B) open and close in response to the energization of the coil, the bypass circuit comprising: a first switch (Fig. 4 element 26left) connected in parallel with the contacts of the switching device, the first switch movable between an open position and a closed position; an energy dissipation device (Fig. 4 element 242) operatively connected to the coil to

Art Unit: 2836

dissipate a portion of the energy released by the coil as the coil is de-energized (col. 12 lines 38-41); and a driver (Fig. 4 element 252) interconnecting the energy dissipation device and the first switch, the driver closing the first switch prior to the opening of the contacts in response to the portion of energy absorbed by the energy dissipation device (col. 4 lines 63-68 & col. 5 lines 1-3).

Regarding claim 19 Hongel discloses the bypass circuit of claim 18. Hongel further discloses wherein the driver is a transformer (Fig. 4 element 252), the transformer having a primary side (Fig. 4 element 254) operatively connected to the energy dissipation device (Fig. 4 element 242) and a secondary side (Fig. 4 element 253) operatively connected to the first switch (Fig. 4 element 26left).

Regarding claim 21 Hongel discloses the bypass circuit of claim 18. Hongel further discloses wherein the electrical energy passing between the contacts has an AC waveform (col. 1 lines 56-67; Hongel describe <US 3639808> which discloses a similar circuit for AC) and wherein the bypass circuit further comprises a second switch (Fig. 4 element 26right) operatively connected to the driver (Fig. 4 element 252) and being connected in parallel with the contacts (Fig. 4 element 10B) of the switching device, the second switch movable between an open position and a closed position (col. 4 lines 63-68 & col. 5 lines 1-3).

Regarding claim 22 Hongel discloses the bypass circuit of claim 21. Hongel further disclose the bypass circuit of claim 21 wherein the driver (Fig. 4 element 252) closes the second switch (Fig. 4 element 300, where 300 is a multivibrator that changes states) prior to the opening of the contacts (Fig. 4 element 10B) in response to the portion of energy dissipated by the energy dissipation device (col. 12 lines 38-41 & Fig. 4 element 242).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hongel (US 4959746) in view of Beurrier (US 3694765).

Regarding claim 9 Hongel discloses the bypass circuit of claim 7. Hongel does not disclose wherein the transformer has a turn ratio of 1:1.

Art Unit: 2836

Beurrier teaches wherein the transformer has a turn ratio of 1:1 (col. 3 lines 1-7 and Fig. 1 element T).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Hongel device with the Beurrier device features because this application describes a coupling circuit for coupling one or more signal sources to a common load without disturbing any of the coupled circuits, then this isolation is highly desired when preventing arcing.

Claim 20 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hongel (US 4959746) in view of Blain et al. (US 6347024).

Regarding claim 20 Hongel discloses the bypass circuit of claim 19. Hongel does not disclose further comprising a varistor connected in parallel with the contacts of the magnetic switching device.

Blain et al. teaches further comprising a varistor connected in parallel with the contacts of the magnetic switching device (col. 3 lines 66-67 & col. 4 lines 1-2 & Fig. 1 element 50).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Hongel device with the Blain et al. device features because the varistor provides extra protection for overvoltages which is the main purpose of this circuit (prevent arcing).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis E. Román whose telephone number is (571) 272 – 5527. The examiner can normally be reached on Mon – Fri from 7:15 AM to 3:45 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from Patent Application Information Retrieval (PAIR) system.

Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LR/12122002

Luis E. Román
Patent Examiner
Art Unit 2836


BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800